

Nov. 30, 1965

W. C. LOVELL

3,220,544

PACKAGING AND NOVEL CONTAINER EMPLOYED THEREWITH

Filed April 26, 1963

2 Sheets-Sheet 1

Fig. 1.

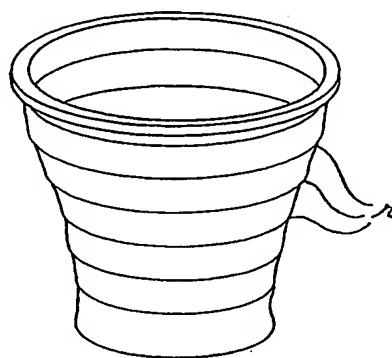
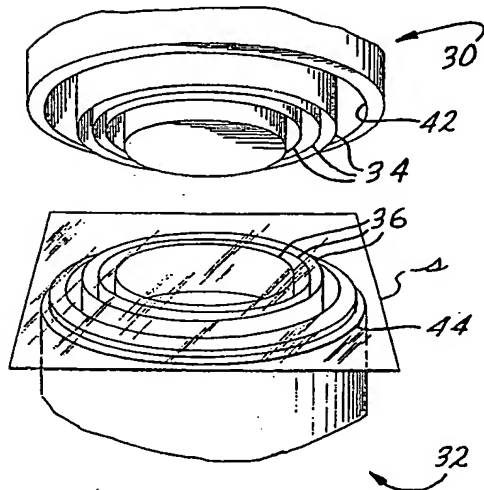
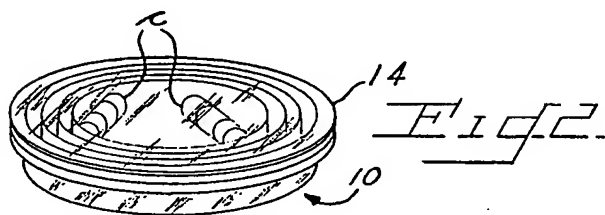
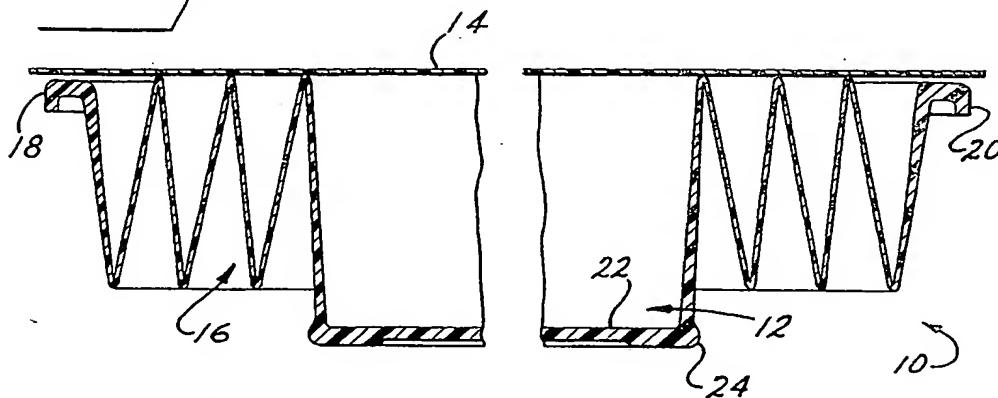


Fig. 4.

Fig. 3.

INVENTOR
Walter C. Lovell
BY Chapin & Neal
Attorneys

Nov. 30, 1965

W. C. LOVELL

3,220,544

PACKAGING AND NOVEL CONTAINER EMPLOYED THEREWITH

Filed April 26, 1963

2 Sheets-Sheet 2

Fig. 5.

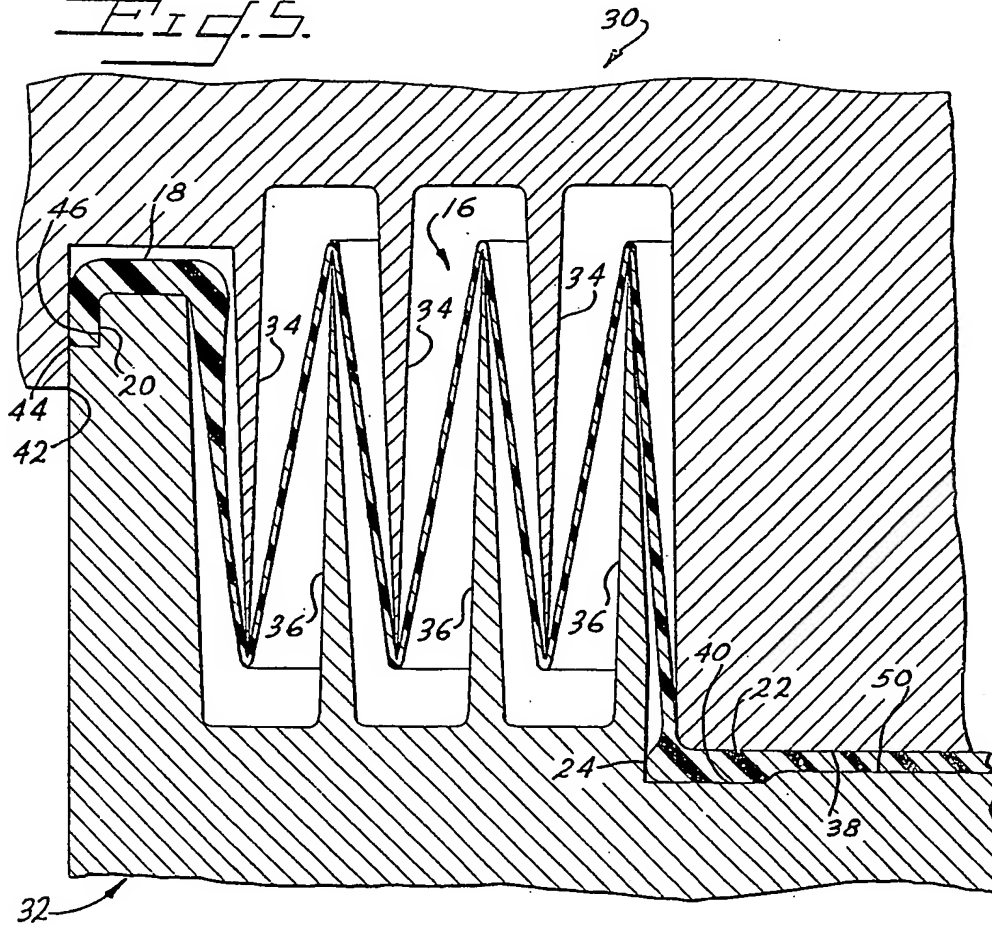
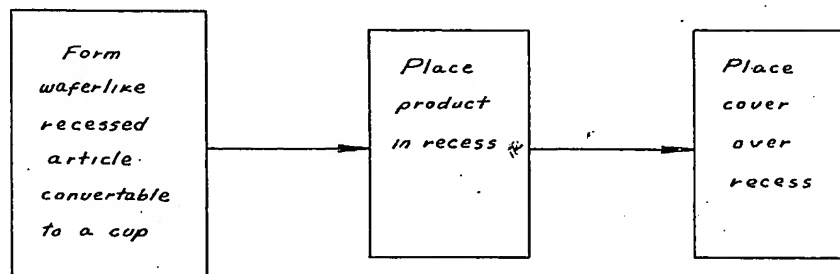


Fig. 6.



INVENTOR
Walter C. Lovell
BY *Chapin & Neal*
Attorneys

3,220,544 PACKAGING AND NOVEL CONTAINER EMPLOYED THEREWITH

Walter C. Lovell, 5 James St., Hazardville, Conn.

Filed Apr. 26, 1963, Ser. No. 275,822

6 Claims. (Cl. 206-46)

The present invention relates to improvements in packaging wherein the package also incorporates a novel container, in particular a disposable drinking cup.

The primary object of the invention is to provide an improved and inexpensive packaged product of the type in which the package may be converted into a container for use in mixing the product or to provide a drinking cup.

Ancillary to this, it is another object of the invention to drastically reduce the cost of drinking cups or the like, and also to provide an improved cup which is originally formed as a wafer-like article requiring a minimum of space for storage or shipment.

A further object of the invention is to provide improved means and methods for attaining the above ends.

The package of the present invention takes the form of a relatively thin, wafer-like article having a recessed portion in which product is stored. The product is held in this recess preferably by a removable cover. In usual practice the cover is removed and the wafer-like article, having a series of accordion pleats formed peripherally of the recess, is expanded into a receptacle of substantial size.

As an article, the wafer-like member is characterized by the edges of the pleats being spaced apart and preferably by the extreme thinness of the material forming the pleats. Other preferable features include a relatively thick bottom for the recess which projects below the pleats and has a protruding bead. The pleats terminate in a relatively thick outer rim; this and the protruding bead may be firmly gripped to unfold the pleats in erecting the cup. The thick rim also provides a desirable drinking edge.

The wafer-like article is advantageously formed by a pair of dies which include concentric interdigitable circular blades. One of the dies also has a central plunger for forming the product receiving recess. A sheet material, preferably plastic which is softened by heating, is placed between these dies which are then closed. The rings of the dies are sharpened so as to partially cut through the plastic as it is stretched to form the accordion pleats. The material contacted by the central plunger is not stretched and retains essentially its original thickness. In order to provide a substantial bead on the bottom of the recess, a base is provided opposite the central plunger for mushrooming the material of the recess bottom.

In forming a package, product is placed in the recess of the wafer-like article and then a cover is applied to retain the product therein. Preferably a pressure sensitive cement is applied to the upper edges of the accordion folds, at least those adjacent the recess. The rim is advantageously at a lower level. The cover is then applied and held by the cement. With the cover, or a portion thereof extending to the rim, its removal is facilitated. The pressure sensitive cement further enables removal of the cover within tearing the pleats which are to form the cup.

The above and other related objects and features of the invention will be apparent from a reading of the following description of the disclosure found in the accompanying drawings and the novelty thereof pointed

In the drawings:

FIG. 1 is a view, in cross section, of a package embodying this invention;

FIG. 2 is a perspective view, on a reduced scale, of the same package;

FIG. 3 is a perspective view showing the cup which is formed from this package;

FIG. 4 is a perspective view of a set of dies employed herein;

FIG. 5 is a cross section, on a greatly enlarged scale, of these dies in a closed position; and

FIG. 6 is a block diagram of the method steps employed in forming the present package.

Referring first to FIGS. 1 and 2, the present package comprises a wafer-like member 10 having a central recessed portion 12 which contains product, two capsules *c* are illustrated. The capsules are retained in the recess 12 by a cover 14 which is secured in overlying relation to the member 10.

A series of accordion folds or pleats 16 are connected to the recessed portion 12 peripherally thereof and terminates in outer rim 18. When it is desired to use the contents of the package, the cover 14 is ruptured, or preferably removed, and the pleats are unfolded to form a container, viz. cup, as shown in FIG. 3. This cup is then ready for use to hold water for taking the capsules. While this package has general utility, certain uses are of particular importance. Thus, this package can economically be used for complimentary aspirin or the like in hotels and airlines and also for dispensing of medicine in hospitals and doctors' offices. Certain products which are affected by moisture may ideally be packaged in amounts needed for a single use, effervescent mouth wash being a good example. Another use is where a container is required for mixing as with catalyst types of cements, the cup may be used and then thrown away.

From the following it will be apparent that the cup provided hereby is so inexpensive that its cost is negligible and it is practical to consider it disposable in many applications not previously thought possible.

Beyond convenience, there are also other less obvious features both as to the package and the wafer-like member from which the cup is formed. Referring again to FIG. 1 and also to FIG. 5, the rim 18 is relatively thick, preferably in the order of .010" or greater, and has a downturned flange 20, both features giving rigidity and a desirable drinking edge. The bottom of the recessed portion 12 is formed by a relatively thick disc 22 and has the center of its lower surface relieved to give greater stability to the cup. It is also preferable that the bottom have an outwardly projecting bead 24 and be disposed below the level of the pleated portion 16. This arrangement facilitates gripping of the bottom 22 as the rim 18 is pulled upward to unfold the pleats and form the cup.

The accordion pleats 16 also embody features which are not readily apparent. The material of the pleats is relatively thin, preferably less than .005 and advantageously between .0005 and .002 inch. This accounts in part for the extreme economy of the cup. It will also be noted that the edges of the pleats are sharply creased and are slightly thicker than the sides of the pleats. These edges form reinforcing rings *r* (see FIG. 3) in the cup which prevent its inward collapse when normally gripped in use. It will also be noted that adjacent pleat edges are spaced apart to facilitate unfolding of the pleats. To augment this facility it is further preferable that the side of the pleats outwardly of each lower edge approach a vertical position whereas the inner sides of the pleats are inclined from the vertical to the adjacent upper edge at a substantially greater angle. It is preferable that the angle of inclination of the inner sides of the pleats be 9° or more.

preferably secured to the upper pleat edges which lie in a common plane. It is likewise preferred to employ a releasable adhesive which is applied only to these pleat edges so that the cover may be readily removed. The selection of the cover material and the cement is advantageously such that neither the cover nor the pleats are ruptured or torn in removing the cover particularly where the cup is to be used for drinking purposes. The selection of such materials is well within the skill of one working in the art, taking into account toxicity and compatibility of materials. A cover of clear polystyrene secured by latex to a member, formed of polypropylene, is given for illustrative purposes.

It will be noted that the rim 18 is disposed below the level of the upper pleat edges. This facilitates the use of a roller to apply adhesive only to the pleat edges leaving the rim clean for drinking purposes. The cover or a portion thereof projects beyond the outer pleat edge to which adhesive has been applied to facilitate its removal.

It was noted above that hydroscopic materials, such as an effervescent mouthwash may be advantageously sold in the present package. The plurality of seals between the cover and the pleats effectively protects such products from moisture vapor as there are a succession of chambers through which the vapor may pass only with great difficulty as the vapor pressure is reduced in successive chambers.

Turning now to the manufacture of the wafer-like member 10, reference is made to FIGS. 4 and 5 which illustrate the working portions of the dies which are employed. The dies comprise upper and lower members 30, 32, each of which comprise a set of spaced concentric circular blades 34, 36. A plunger 38 is disposed centrally of the blades 34 and projects therebelow. A base 40 is disposed centrally of the blades 36 in cooperative relation with the plunger 38 as will later be described.

A sheet *s* of plastic material is placed between the dies 30, 32 which are then brought to their closed position (FIG. 5) by conventional means. The plastic sheet material is preferably polypropylene heated sufficiently to be softened (in the order of 200° F.) and relatively thick (in the order of .015"). The dies are at a normal ambient temperature (70° to 85° F.). The blades 34, 36 are preferably thinly tapered to sharp edges.

The dies are closed with sufficient speed so that the blades cut partially through the plastic sheet and simultaneously stretch the plastic material to form the sides of the pleats as the blades are brought into interdigitating relation (FIG. 5). Selected portions of the plastic material harden as the cooler edges of the blades 34, 36 are engaged. However, the remainder of the plastic is spaced therefrom so that it will be uniformly, or substantially uniformly stretched to form the sides of the pleats with a very thin section. It is a matter of routine experimentation to establish the proper rate of closure so that this combination of partial cutting and stretching will enable the illustrated form of pleat to be obtained for any given size and shape of mold.

The mold may also be employed to cut the member 10 from the sheet *s* through the provision of cooperating shearing edges 42, 44. The lower die 32 is also relieved at 46 to form the downturned flange 20.

The central plunger 38 first engages the sheet *s* and that portion of the sheet begins to harden immediately so that it retains substantially its original thickness. When the dies are fully closed the plastic beneath the plunger is compressed against the base 40 which has a raised portion 50 which forms the relief in the lower surface of the disc 22. Also as the plastic is compressed, it mushrooms out from the plunger 38 to form the bead 24.

The dies are then opened and the finished wafer-like member removed. Working with such thin sections the cycle time can be a matter of seconds or less. This plus the small amount of plastic required and the relatively

low cost which makes the present cup disposable for a wide number of uses hitherto impractical.

Referring now to FIG. 6, the block diagram describes the method steps of manufacturing the present package in their broader terms. The first step is the formation of a wafer-like member having a central recess and a peripheral accordion pleated portion enabling it to be converted into cups. Placing product in the recess and then securing a cover to the member overlying the recess to retain the product therein. The more specific features of the method aspects of the invention will be apparent from the foregoing description.

It will be apparent that variations may be made in the present disclosure and that certain materials will be equivalent to what is described. The scope of the invention is, therefore, to be measured solely from the following claims.

Having thus described the invention what is claimed as novel and desired to be secured by Letters Patent of the United States is:

1. A package comprising a wafer-like article adapted to be converted into a cup or the like, and having a central bottom forming portion connected to an integrally surrounded by sheet material having a series of circular accordion pleats, the edges of which are sharply creased, said pleats terminating in an outer rim disposed at a level below that of the upper edges of the pleats, the walls of said pleats intermediate those connected to the rim and bottom forming portion having a thickness no greater than approximately .005", said bottom forming portion being disposed at a level beneath the level of the lower edges of the accordion pleats, said rim and bottom forming portion having a greater thickness than that of the pleats, said bottom forming portion having a protruding bead to facilitate unfolding of said pleats to form a cup, the inner side of said pleats, which is connected to the bottom forming portion, forming a recess, product disposed in said recess, and a cover removably secured to the upper edges of said pleats in overlying relation to said recess to retain the product therein, at least a portion of the cover projecting in overlying relation to said rim to facilitate removal of the cover, said wafer-like article being formed of a plastic material which is permanently distorted at the sharp edges of the pleats when the bottom forming portion is displaced from the rim to unfold the pleats to form the wall of a cup having vertical rigidity.

2. A package as in claim 1 wherein the cover is removably secured to said pleat edges by pressure-sensitive cement applied only to said edges and facilitating its removal without injury to said wafer-like element.

3. A package comprising a wafer-like article adapted to be converted into a cup or the like, said article being integrally formed of polypropylene and comprising a relatively thick central disc having the central portion of its lower surface relieved, said disc being connected to and peripherally surrounded by relatively thin sheet material formed in a series of accordion pleats, the sides of the pleats having a thickness between .0005" and .002", said pleats terminating in a relatively thick outer rim having a down-turned peripheral flange, the edges of said pleats being sharply creased and spaced apart, the opposed edges of said pleats lying in spaced parallel planes, the sides of said pleats extending upwardly from each lower edge being disposed with the outer side approaching a vertical line and the opposed side at a substantially greater angle from the vertical, the side of said pleats, to which said central disc is connected, extending below the lower of said planes and defining a recess, said disc having a peripheral bead which may be readily gripped to displace the disc relative to the rim and unfold the pleats so that they form the wall of a cup as the central disc forms the bottom thereof, product disposed in said recess and a cover removably secured to the upper edges of said pleats by pressure-sensitive cement applied only to said upper

5

jury of said wafer-like element, said outer rim being disposed at a lower level than the upper edges of said pleats and said cover extending in overlying relation to said rim to further facilitate its removal.

4. An article of manufacture adapted to be converted from wafer-form into a cup or the like, said article being integrally formed of polypropylene and comprising a relatively thick central disc, said disc being connected to and peripherally surrounded by relatively thin sheet material formed in a series of circular accordion pleats, terminating in a relatively thick outer rim having a downturned peripheral flange, the edges of said pleats being sharply creased and spaced apart, the walls of said pleats intermediate those connected to the rim and central disc having a thickness no greater than approximately .005", the polypropylene material being permanently distorted to maintain an open position when the bottom forming portion is displaced from the rim to unfold the pleats to form the wall of a cup having vertical rigidity, the opposite edges of said pleats lying in spaced parallel planes, the side of said pleats extending upwardly from each lower edge being disposed with the outer side approaching a vertical line and with the opposed side at a substantially greater angle from the vertical, the side of said pleats to which said central disc is connected extending below the lower of said planes, said disc having a peripheral bead which may be readily gripped to displace the disc relative to the rim and unfold the pleats so that they form the wall of a cup as the central disc forms the bottom thereof.

5. An article of manufacture as in claim 4 wherein the

6

lower surface of the central portion of the central disc is relieved to give added stability when the wafer-like article is used as a cup.

6. An article of manufacture as in claim 4 wherein the thickness of said intermediate pleat walls is between .0005" and .002".

References Cited by the Examiner

UNITED STATES PATENTS

10	1,257,949	2/1918	Adelson.	
	1,885,757	11/1932	Orlopp	206—47
	2,331,762	10/1943	Brown	53—30
	2,438,434	3/1948	Friedman	220—8
	2,660,761	12/1953	Peters	18—56
15	2,880,902	4/1959	Owsen	220—8
	2,899,110	8/1959	Parker.	
	2,915,176	12/1959	O'Neil	206—47
	2,942,301	6/1960	Price et al.	18—56
	2,985,915	5/1961	Winstead	18—19
20	2,990,581	7/1961	Rowe.	
	3,010,262	11/1961	Rumsey	53—30
	3,054,144	9/1962	Goodwin et al.	18—19
	3,121,767	2/1964	Welshon.	
25	3,145,838	8/1964	Van Duesen	206—47

FOREIGN PATENTS

1,124,843 7/1956 France.

30 THERON E. CONDON, *Primary Examiner.*

EARLE J. DRUMMOND, *Examiner.*